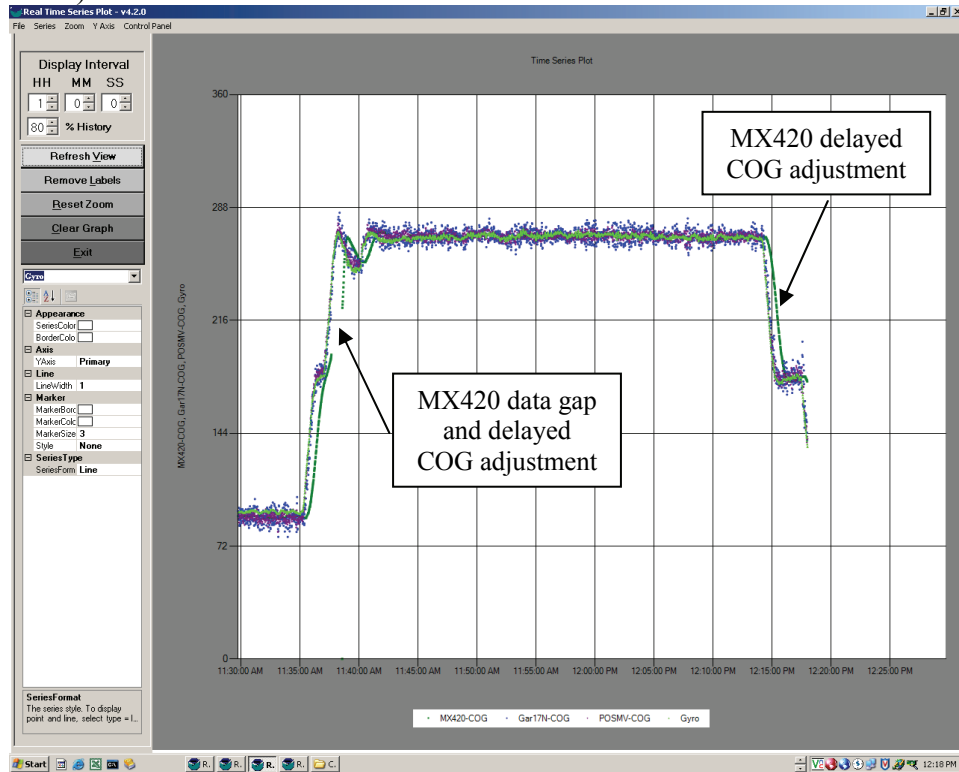# Cruise OD0801 – Some Observed Problems with Sensors and Data

MX420: There is a delay in the MX420's COG adjustment after turns compared to the Gar17N, POSMV-COG, and Gyro. The MX420 has also had numerous brief outages as demonstrated by the data gap present below (February 8, 2008 GMT).

ADCP: SCS is receiving the VDDBT message from the ADCP. The ADCP configuration file has a +9.10 meter transducer depth value in it ("9.10 m" appears in Xdcr Depth window under the Leader section). It is evident this configuration variable does <u>NOT</u> correct ADCP values to DBS (see below).

Most SCS Depth sensor names have been standardized as follows:
"Depth" = Depth below suface (DBS)
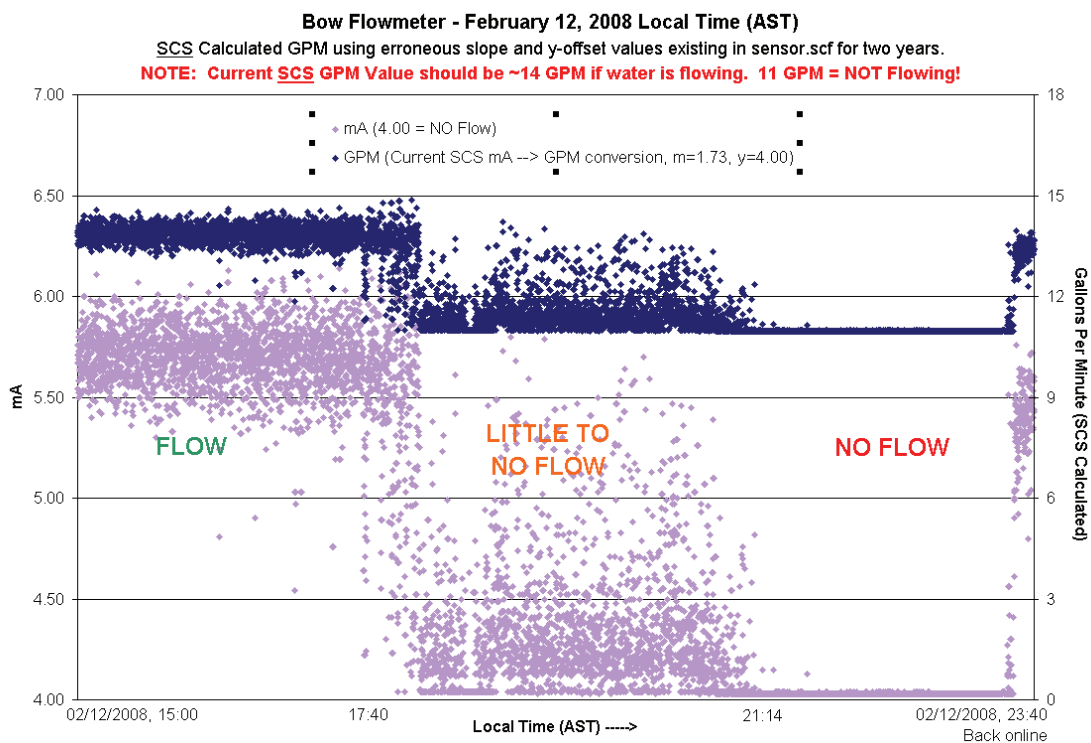"UKC"   = Under keel clearance (UKC = DBT)

The ADCP child, ADCP-Depth-m, equals UKC/DBT. The ADCP data output AND the bottom track/range values under the Bottom Track section equal Doppler-UKC-m values. It is approximately 9 meters shallower than EK60-Depth-m (DBS) (see figure below). Thus, as of 09Feb2008, ADCP-Depth-m does not follow the standardized naming scheme. The name will be changed to ADCP-UKC-m, and UKC sensors in fathoms and feet and "Depth" (DBS) sensors will be created in the future.

BowFlow-mA and -GPM Data: Communication with the Bow flow meter, close to the scientific seawater system intake, was established at the end of February 7, 2008 GMT; however, data remained constant at ~ 4.04 mA and ~ 10.99 GPM (derived from 4.04 mA in SCS). The GPM values on the display units in Acoustics and the Chemlab constantly changed and fluctuated between ~8.0 – 13.0 GPM; thus, logged SCS data is invalid.
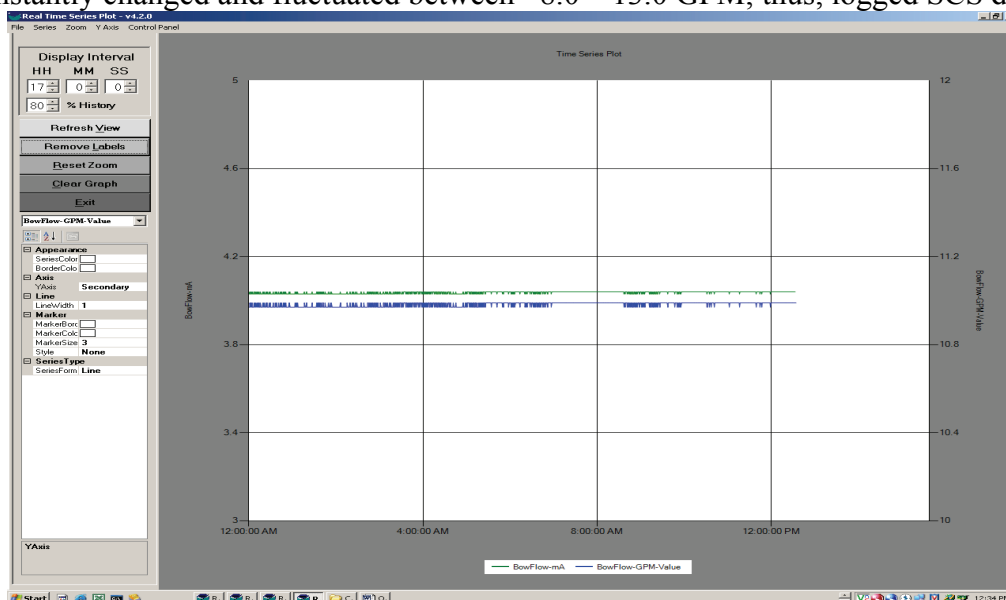

February 12, 2008: the previous problem was due to the wrong flow output being sent to SCS. The raw mA output now comes into SCS and is valid. For mA to GPM conversion, the existing slope (1.73) and offset (4.00) values, used in sensor.scf files over the past two years, are not correct (see graph below). These coefficients do not equate to the sensor.scf comment, "4 ma = 0 l/s   20ma = 3.6 l/s   1 gal = 3.78 l". All BowFlow-GPM data is invalid.


Bow Flowmeter - February 12, 2008 Local Time (AST)
SCS Calculated GPM using erroneous slope and y-offset values existing in sensor.scf for two years.
NOTE: Current SCS GPM Value should be ~14 GPM if water is flowing! 11 GPM = NOT Flowing!

Based on the comment "4 ma = 0 l/s   20ma = 3.6 l/s   1 gal = 3.78 l", the regression coefficients would be m = 3.566323 and y = -14.265291 for mA to GPM conversion. However, application of these to raw mA values does not duplicate the GPM values seen on the Acoustics and Chemlab display units. It is currently unknown which, if either, GPM values are correct.

POSMV Heading sensors: values were in error February 8, 2008, between ~ 1438 and 1455 GMT (pictured below), and February 11, 2008, ~1017 – 1022 GMT.
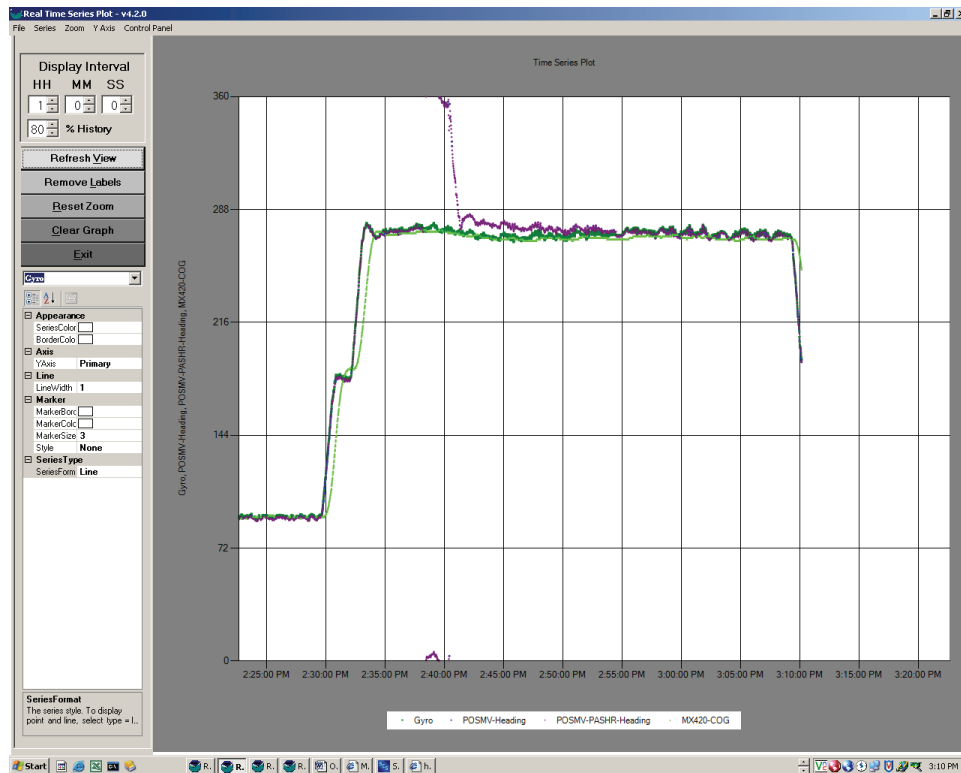

POSMV SOG: values were in error February 8, 2008, between ~ 1438 – 1441 GMT
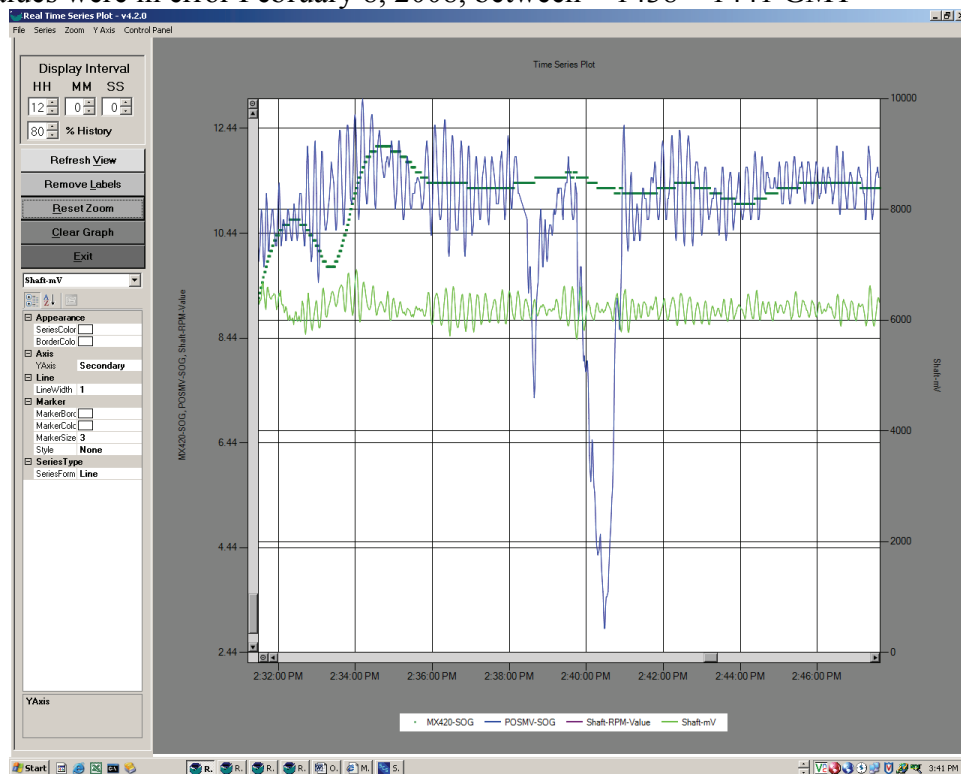
Wind Speed and Direction: Wind (relative and true) data is variable and unreliable when the wind is coming from astern. All wind data needs to be examined in relation to Gyro Heading and SOG data. The wind sensor may also be slightly misaligned with the ship's centerline. The alternating wind speed and direction patterns in the first image were also observed during transect sets when the wind was not from astern. However, if there is any misalignment, its impact is difficult to determine. The Miller Freeman had the exact same pattern observed in the second image, possibly as a result of land mass effects.

February 8, 2008.
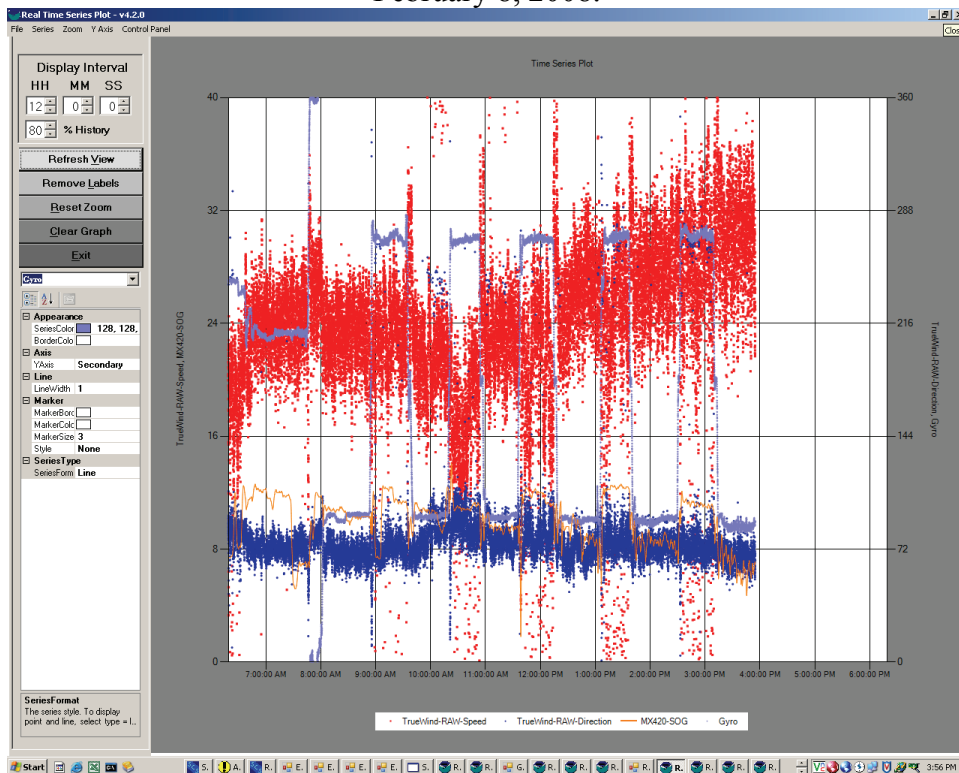
February 10 – 11, 2008 (2000 – 1600 GMT)
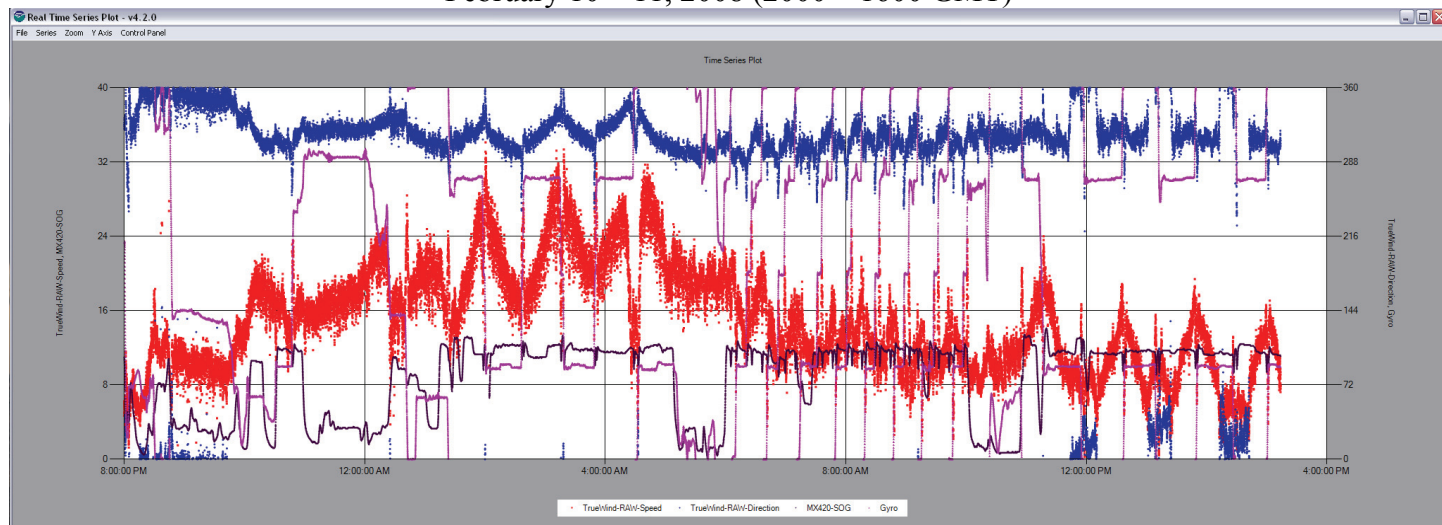
Furuno Hull (HIGH, MID, LOW) Sea Temperatures: Raw sensor data is not calibrated; the MID sensor is noticeably ~0.3 C higher than the HIGH and LOW sensors (top half of all images). SBE19s have been lowered to the locations of each Furuno hull temperature sensor in order to calibrate them. One calibration was done in warmer water in Seattle, and a second calibration was done in Three Saints Bay on February 6, 2008. See "\Data Documentation\Furuno (Hull Temp) Calibration Files" directory for the raw calibration data. From Kodiak to just before the start of transects, the Seattle (warm water) coefficients were used for "*-SeaTemp-C-Cal" sensors (sensor_20080206-042941.scf):

HIGH:	m = 0.999945, y = -0.031030
MID:	m = 0.999246, y = -0.208584
LOW:	m = 1.000116, y = +0.048122

February 07, 2008 Comparison – Before restarting SCS ACQ with Three Saints Bay (cold water) coefficients.
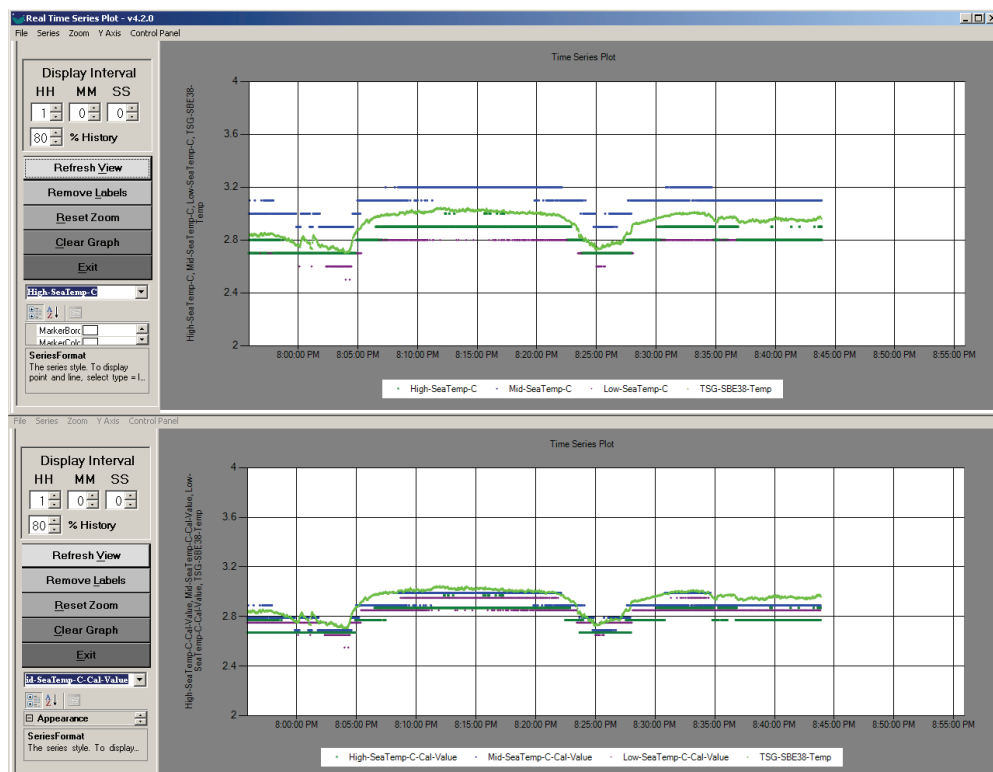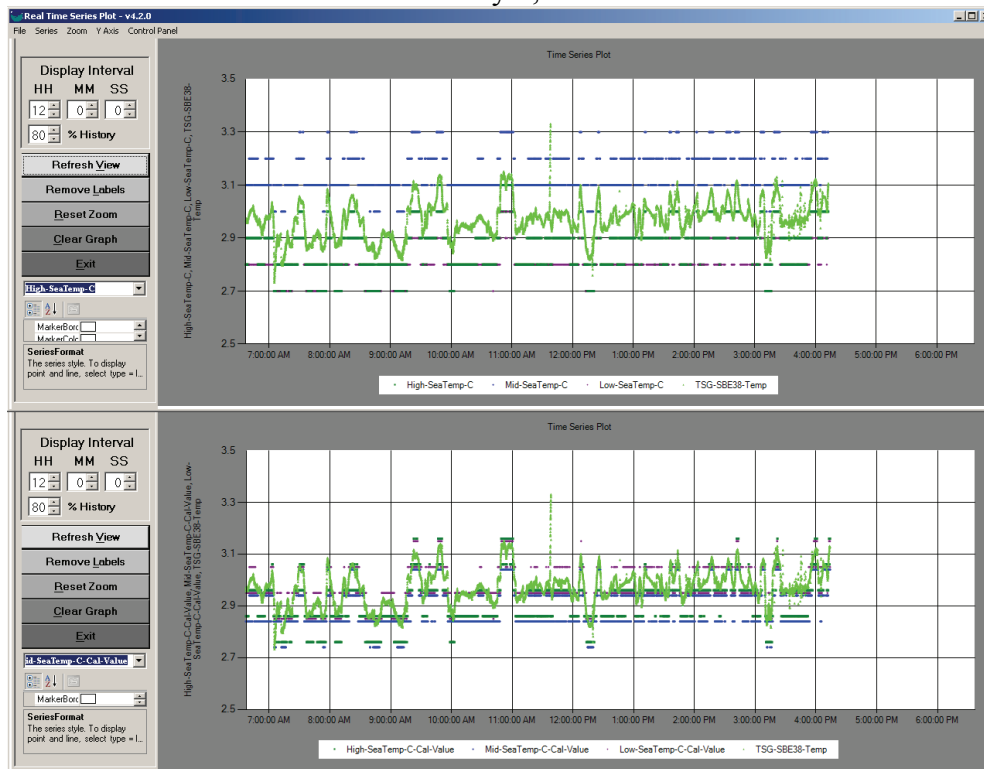
From just before the start of transects on February 07, 2008 to the end of the cruise, the Three Saints Bay (cold water) regression coefficients were used for the "*-SeaTemp-C-Cal" sensors (sensor_ 20080207_204411.scf):
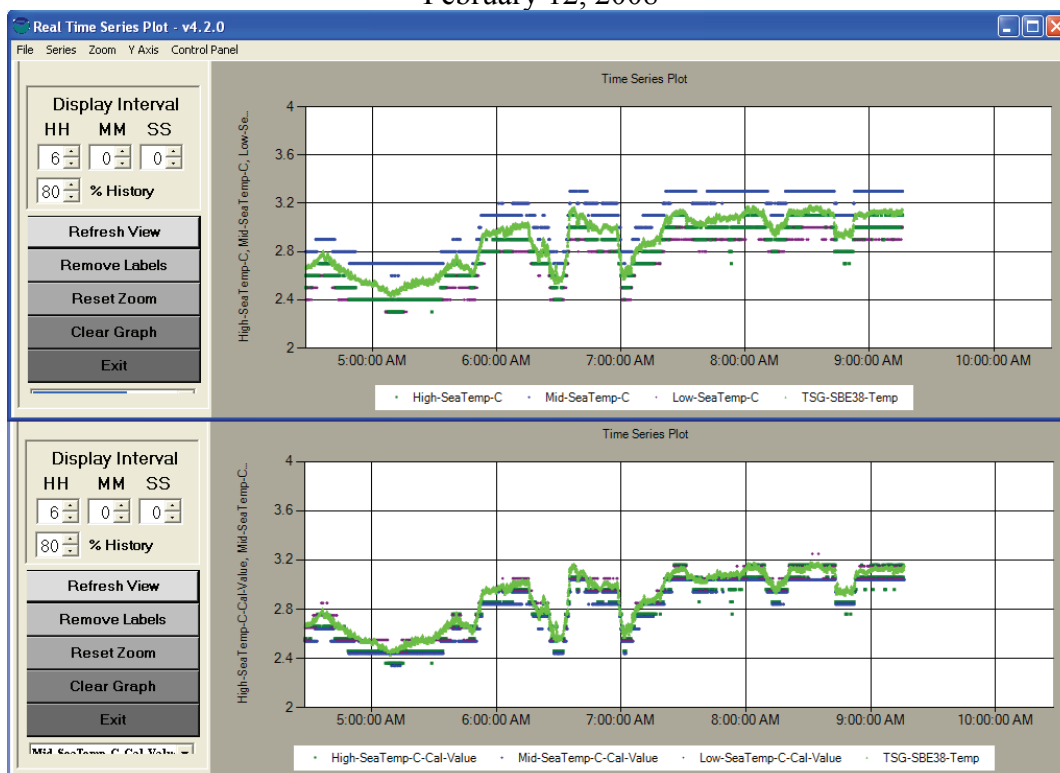
HIGH: m = 1.000015, y = +0.064798
MID: m = 0.999948, y = -0.254865
LOW: m = 1.000150, y = +0.149487
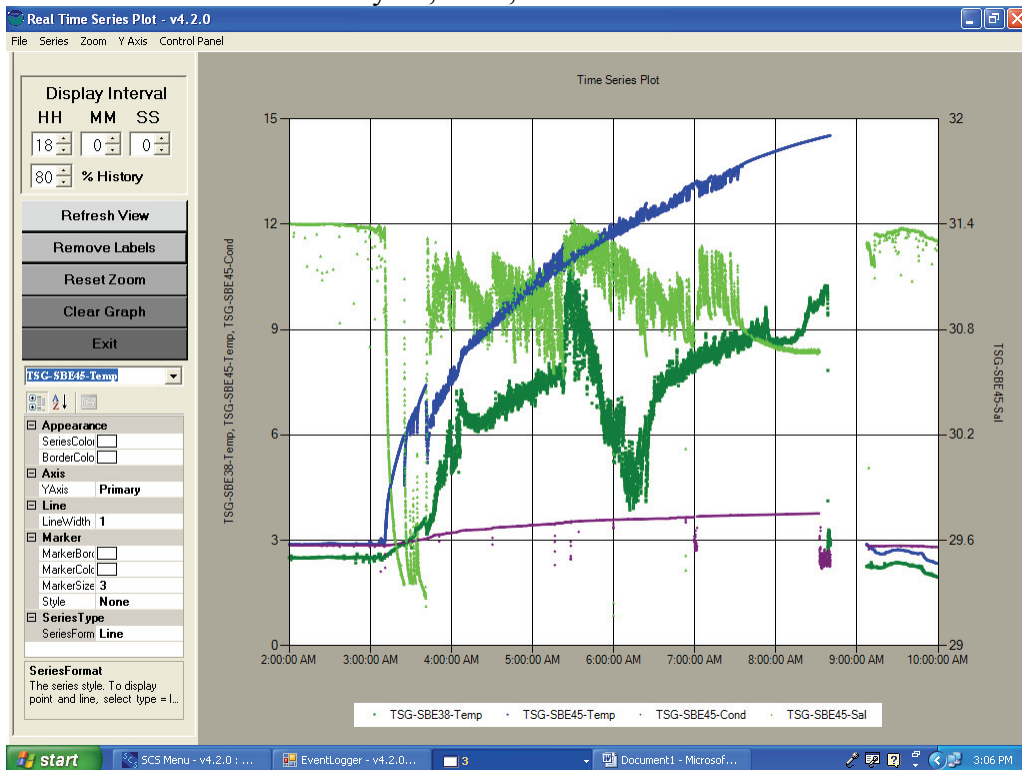
February 8, 2008

February 12, 2008

TSG/Fluorometer: On several occasions, rough seas resulted in air getting into the scientific seawater system. SBE-38 and SBE-45 (both in TSG folder), and Fluorometer data were affected. Significant effects exist in the data when there was no water in the system (see below for known time periods) and data flow to SCS was not turned off. Sporadic effects also exist.
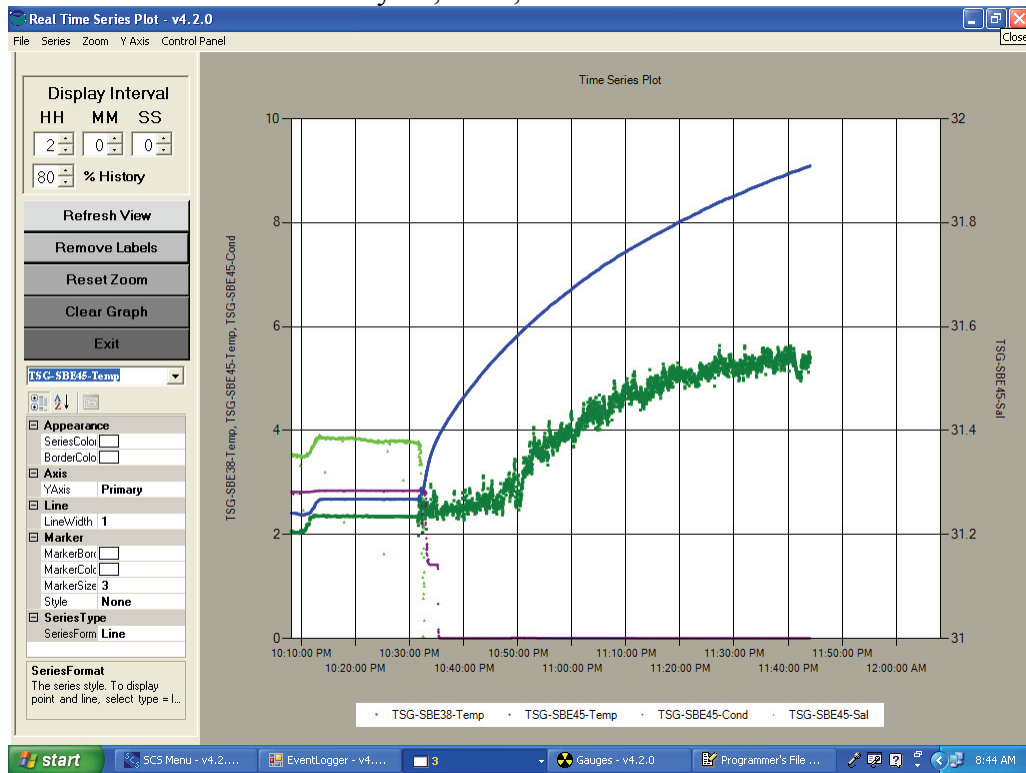
February 8, 2008, just before 1800 GMT
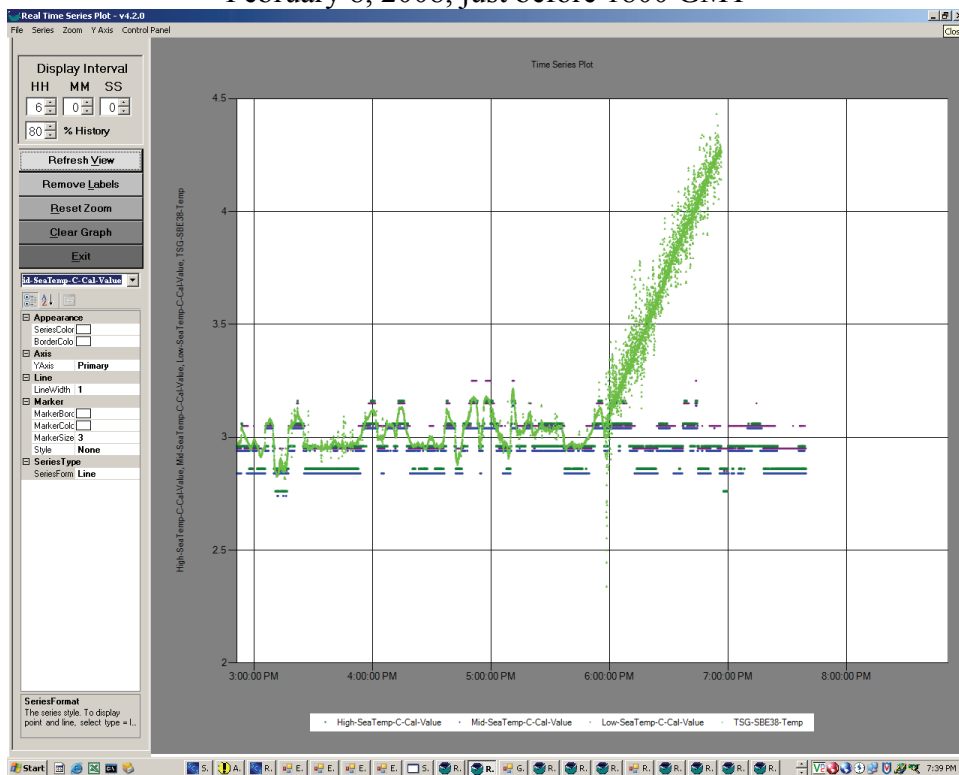
February 13, 2008, 0310 – 0840 GMT

February 13, 2008, 2232 - 2344 GMT

Changing filters at the TSG/Fluorometer system causes slight, temporary effects to at least the SBE45 data (affect on Fluorometer data is unknown). See the TSG-SNAP_edited.elg file in EventData\TSG for filter change times.